U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Schiedea pubescens*

COMMON NAME: Maolioli

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: May 11, 2004
__ 90-day positive - FR date:
_X_ 12-month warranted but precluded - FR date: May 11, 2005
_N_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.
Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

_N_ Listing priority change
Former LP: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): July 1, 1975
___ Candidate removal: Former LPN: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.
___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a

proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.

___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Caryophyllaceae (Pink family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Maui, Molokai, and Lanai

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Maui, Molokai, and Hawaii

LAND OWNERSHIP: *Schiedea pubescens* occurs on both private and State lands.

LEAD REGION CONTACT: Linda Belluomini, (503) 231- 6283, linda_belluomini @fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description

Schiedea pubescens is a reclining or weakly climbing vine with a woody base. The plant is glabrous except for the inflorescence, which has dense purple-tinged hairs. The stems are 40 to 240 inches (in) (10 to 60 decimeters) long with internodes that are usually 2.4 to 4.7 in (6 to 12 centimeters (cm)) long. Opposite, green leaves are sometimes purple tinged especially along the midrib. In addition they are thick, leathery and narrowly lanceolate. The tiny flowers are perfect and are arranged in open cymes. The inflorescence is 12 to 20 in (30 to 50 cm) long with green bracts, which are sometimes tinged with purple (Wagner *et al*. 1999a, p. 519).

Taxonomy

Schiedea pubescens was described by Hillebrand (1888). This species is recognized as a distinct taxon in the *Manual of Flowering Plants of Hawaii* (Wagner *et al*. 1999a, p. 519), and Wagner *et al*. (2005), the most recently accepted Hawaiian plant taxonomy.

Habitat/Life History

This species occurs in diverse mesic to wet *Metrosideros* (ohia) forest at elevations between 2,000 and 3,000 feet (ft) (600 and 900 meters (m)) (Hawaii Biodiversity and Mapping Program (HBMP) 2008; Wagner *et al*. 1999a, 519).

Historical Range

Schiedea pubescens was historically found scattered on the islands of Molokai, Lanai, and Maui. On Molokai, it was found from Kalae to Pukoo ridge. On Maui this species was known from the western mountains at Olowalu, Kaanapali, and Waihee, and from the eastern mountains at Makawao; and on Lanai it was known from the Lanaihale area (HBMP 2008).

Current Range/Distribution

This species, which is declining and extremely threatened, is known from 13 populations on Maui, Molokai, and Hawaii (HBMP 2008; K. Wood, National Tropical Botanical Garden, pers. comm. 2001; A. Bakutis, Plant Extinction Prevention Program (PEP), pers. comm. 2010; S. Perlman, NTBG, pers. comm. 2010; H. Oppenheimer, PEP, pers. comms. 2006, 2010).

Population Estimates/Status

Currently, *Schiedea pubescens* is limited to the islands of Maui, Molokai, and Hawaii. On Hawaii this species occurs at the Pohakuloa Training Area (4 to 6 individuals). On Maui, there are 8 populations totaling 30 to 32 individuals at Honokowai, Hahakea, Iao, Nakalaloa stream, Helu, Ukumehane, Papalaua and Pohakea. On Molokai, there are 4 populations: at Waihanau stream, Waianui gulch, Waimanu stream, and Kawela ditch trail, totaling 21 to 22 individuals (HBMP 2008, K. Wood, National Tropical Botanical Garden, pers. comm. 2001; A. Bakutis, pers. comm. 2010; S. Perlman, pers. comm. 2010; H. Oppenheimer, pers. comms. 2006, 2010).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range. *Schiedea pubescens* is highly and imminently threatened by feral pigs (*Sus scrofa*) and feral goats (*Capra hircus*) that degrade and destroy habitat (HBMP 2008). Evidence of the activities of feral pigs has been reported at the Hawaii, Maui, and Molokai populations, and of feral goats at the Hawaii population (HBMP 2008).

Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). A study was conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui (Diong 1982). This valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, with *Acacia koa* (koa) and *Metrosideros polymorpha* (ohia). Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 in (20 cm), greatly disrupting the leaf litter and topsoil layers, contributing to erosion and changes in ground topography. The feeding habits of pigs created seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982). The effects on mesic and wet forest habitat by foraging of feral pigs have also been reported in fencing studies. In a fencing study conducted in the montane bogs of Haleakala, it was found that when feral pigs were fenced out of an area the

cover of native plant species increased from 6 percent to 95 percent within six years of protection (Loope *et al*. 1991).

The goat, a species originally native to the Middle East and India, was successfully introduced to the Hawaiian Islands in 1792. Currently, populations exist on Kauai, Oahu, Maui, Molokai, and Hawaii. Goats browse on introduced grasses and native plants, trample roots and seedlings, cause erosion, and promote the invasion of alien plants. Goats are able to forage in extremely rugged terrain and have a high reproductive capacity (Clarke and Cuddihy 1980; van Riper and van Riper 1982; Scott *et al*. 1986; Tomich 1986; Culliney 1988; Cuddihy and Stone 1990). A study conducted at Puuwaawaa on the island of Hawaii demonstrated that prior to management actions in 1985, regeneration of endemic shrubs and trees in the grazed area was almost totally lacking, contributing to the invasion of the forest understory by exotic grasses and weeds. After the removal of grazing animals in 1985, *Acacia koa* (koa) and *Metrosideros* spp. (ohia) seedlings were observed germinating by the thousands (Department of Land and Natural Resources 2002).

Hawaiian ecosystems, having evolved without hoofed mammals, are susceptible to large-scale disturbance by pigs, goats, and other introduced ungulates (Loope *et al*. 1991). Because of demonstrated habitat modifications by feral pigs and goats, such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants, the Service believes they are a threat to *Schiedea pubescens*.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
None known.

C. Disease or predation.
Predation by feral pigs and goats is a likely threat to *Schiedea pubescens* (HBMP 2008).

In a study conducted in the 1980s, feral pigs were observed browsing on young shoots, leaves and fronds of a wide variety plants, of which over 85 percent were endemic species (Diong 1982). A stomach content analysis in this study showed that the pigs' food sources consisted of native plants, 60 percent of which were *Cibotium* spp., (tree ferns) alternating with *Psidium cattleianum* (strawberry guava) when it was available. Pigs were observed to fell plants and remove the bark of *Clermontia*, *Cibotium*, *Coprosma*, *Psychotria*, and *Hedyotis* species, with larger trees killed over a few months of repeated feeding (Diong 1982).

Goats browse on introduced grasses and native plants, and are able to reach more remote and inaccessible areas than other ungulates. They thrive on a variety of food plants, and are instrumental in the decline of native vegetation in many areas (Cuddihy and Stone 1990).

Because Hawaii's native plants evolved without any browsing or grazing mammals present, many lost natural defenses to such impacts (Carlquist 1980). Browsing by ungulates has been observed on many other native species, including common and rare or endangered species (Cuddihy and Stone 1990; Loope *et al.* 1991). Therefore, though we have no direct evidence of browsing for this species, it is likely that pigs and goats impact this species directly as well as the surrounding habitat.

D. The inadequacy of existing regulatory mechanisms.
Schiedea pubescens currently receives no protection under Hawaii's endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

Goats are managed in Hawaii as a game animal, but many herds populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Goat hunting is allowed year-round or during certain months, depending on the area (Hawaii Department of Land and Natural Resources 1999, 2003). However, public hunting is not adequate to eliminate this threat to *Schiedea pubescens*.

E. Other natural or manmade factors affecting its continued existence.
Numerous weed species threaten *Schiedea pubescens* (HBMP 2008). On Hawaii, the nonnative plant that is reported to be the greatest threat is *Pennisetum setaceum* (fountain grass). On Maui, the nonnative plants reported to be the greatest threats are *Psidium cattleianum* (strawberry guava), *Buddleia madagascariensis* (smoke bush), *Rubus rosifolius* (thimbleberry), *Ageratina adenophora* (Maui pamakani), and *Tibouchina herbacea* (glorybush) (HBMP 2008). On Molokai, the nonnative plants reported to be the greatest threats are *Kalanchoe pinnata* (air plant), *R. rosifolius*, and *Melinus minutiflora* (molasses grass) (HMBP 2008).

Ageratina adenophora is native to tropical America, and has naturalized in dry to wet forest on the islands of Oahu, Molokai, Lanai, and Maui (Wagner *et al*. 1999a). Maui pamakani is a shrub 3 to 5 ft (1 to 1.5 m) tall with trailing branches that root on contact with soil. It forms dense mats which prevent regeneration of native plants (Anderson *et al*. 1992; University of California 2006). It is considered a serious weed in agriculture, especially in rangeland, because it often replaces more desirable vegetation or native species, and is fatally toxic to horses and most livestock. The eupatorium gall fly, *Procecidochares utilis*, was introduced to Hawaii in 1944 for control of Maui pamakani, and has been successful in suppression of most of the infestations (Bess and Haramoto 1959).

Buddleia madagascariensis is a sprawling shrub, native to Madagascar, and naturalized in Hawaii in mesic areas. It tolerates a wide range of tropical habitats, forms dense thickets, and is rapidly spreading into wet forest and even lava and cinder substrate areas in Hawaii (Wagner *et al* 1999a; Pacific Island Ecosystems at Risk (PIER) 2006a). The Oahu Invasive Species Committee targets this plant as one of the more invasive nonnative plants in Hawaii (Oahu Invasive Species Committee 2000).

Kalanchoe pinnata is an herb which is widely established in many tropical and subtropical areas. In Hawaii it has been naturalized prior to 1871, and is abundant in low elevation disturbed areas on all the main islands except Niihau and Kahoolawe (Wagner *et al*. 1999). The air plant can reproduce vegetatively at indents along the leaf, usually after the leaf has broken off the plant and is lying on the ground, where a new plant can take root. *Kalanchoe pinnata* can form dense stands that prevent reproduction of native species (Starr 2006).

Melinus minutiflora is native to Africa, and now introduced to many parts of the tropics as a fodder plant. In Hawaii it is naturalized and common in dry to mesic disturbed open areas on all the main islands except Niihau. It is considered to be a serious pest, choking out and covering

native vegetation and preventing seedling establishment (O'Connor 1999). The mats it forms fuel more intense fires (Cuddihy and Stone 1990).

Pennisetum setaceum, a grass native to northern Africa, was introduced to many areas as an ornamental, and is now naturalized in Hawaii. This grass is a serious pest in dry areas. It is an aggressive colonizer, and outcompetes most native species. *Pennisetum setaceum* is also fire-adapted, and burns swiftly and hot, causing extensive damage to the surrounding habitat (O'Connor 1999).

Psidium cattleianum, a tree native to tropical America, has become widely naturalized on all the main islands of Hawaii. Found in mesic to wet forests, strawberry guava develops into dense stands in which few other plants can grow, displacing native vegetation. The fruit is eaten by pigs and birds, which then disperse the seeds throughout the forest (Smith 1985; Wagner *et al*. 1985). To date, no biological control agents have been released against strawberry guava in Hawaii, though insects for biocontrol are undergoing host-screening (Institute of Pacific Islands Forestry 2005).

Rubus rosifolius is native to Asia and is common in Hawaii in disturbed mesic to wet forest on all of the main islands. It is a sparse shrub, covered with prickles, and has edible red fruit. It invades the understory, forming dense thickets and outcompetes native plant species. It easily reproduces from roots left in the ground, and seeds are spread by feral animals and birds. There is no specific management information for *R. rosifolius*, but techniques used for the control of blackberry *R. fruticosus*, which is a related species, may be applicable (PIER 2006b; Global Invasive Species Database 2006).

Tibouchina herbacea, a member of the Melastomataceae family, is native to southern Brazil, Uruguay, and Paraguay. In Hawaii, it is naturalized and abundant in disturbed mesic to wet forest on the islands of Hawaii, Maui, and Lanai (Wagner *et al*. 1999a). It forms dense thickets, crowding out all other plant species and inhibiting regeneration of native plants (The Nature Conservancy 2003). All members of this genus are declared noxious in the state of Hawaii (HAR Title 4, Subtitle 6, Chapter 68). Research is ongoing for biological controls of this species (Smith 1998; The Nature Conservancy 2003).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent were introduced from other parts of the world, and nearly 100 species have become pests (Smith 1985; Wagner *et al*. 1999a). Several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al*. 1998, p. 4) indicate nonnative plant species may outcompete native plants similar to *Schiedea pubescens*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced that inhibits growth of other plants (Smith 1985; Cuddihy and Stone 1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al.* 1992; Ellshoff *et al.* 1995; Meyer and Florence 1996; Medeiros *et al.* 1997; Loope *et al*. 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone

1990; Vitousek *et al*. 1997). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to the diverse mesic to wet forest habitat of *S. pubescens*, the Service believes nonnative plant species are a threat.

Fire is a likely threat to the population in the Army's Pohakuloa Training Area on the island of Hawaii (HBMP 2008). This area is dry, windy, and at risk of fire due to military training activities. The fire-adapted plant identified above (*Pennisetum setaceum*) as a threat to *Schiedea pubescens* can alter the fire characteristics of its habitat (Smith 1989). Because Hawaiian plants were subjected to fire during their evolution only in areas of volcanic activity and from occasional lightning strikes, they are not adapted to recurring fire regimes and do not quickly recover following a fire. Alien plants are often better adapted to fire than native plant species, and some fire-adapted grasses have become widespread in Hawaii. Native shrubland and dry forest can thus be converted to land dominated by alien grasses. The presence of such species in Hawaiian ecosystems greatly increases the intensity, extent, and frequency of fire, especially during drier months or drought. Fire-adapted alien plant taxa can reestablish in a burned area, resulting in a reduction in the amount of native vegetation after each fire. Fire can destroy dormant seeds as well as plants, even in steep or inaccessible areas. Fires may result from natural causes, or may be accidentally or purposely started by humans (Cuddihy and Stone 1990).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The Service has funded several projects through cooperative agreements or grants, which will provide conservation benefits to *Schiedea pubescens*. On Lanai, a non-profit grassroots community organization had constructed an ungulate exclosure fence and will continue to remove nonnative plants in the summit area, which can then be used for reintroduction into areas of historical occurrence (Service 2003). The West Maui Mountain Watershed Partnership, a non-governmental, non-profit partnership composed of west Maui landowners and managers erected some ungulate fencing, and nonnative plant removal is ongoing (Maui Land and Pineapple 2002)**.**

SUMMARY OF THREATS

Based on our evaluation of habitat degradation and loss by feral pigs, goats, and nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species due to the present and threatened destruction, modification, or curtailment of its habitat and range, and the displacement of individuals of *Schiedea pubescens*, due to competition with nonnative plants for space, nutrients, water, air, and light. Predation by feral pigs and goats is a likely threat to *S. pubescens*. Fire is a likely threat to the population at the Pohakuloa Training Area on Hawaii.

RECOMMENDED CONSERVATION MEASURES

- Survey for populations of *Schiedea pubescens* in areas of potentially suitable habitat
- Control feral pigs and goats
- Control alien plants
- Begin propagation efforts for maintenance of genetic stock

- Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
This species is highly threatened by feral pigs and goats that directly prey upon it and degrade and destroy habitat, and by nonnative plants that compete for light and nutrients. Fire is a likely threat to *Schiedea pubescens*. Threats to the diverse mesic to wet forest habitat of *S. pubescens*, and to individuals of this species, occur throughout its range and are expected to continue or increase without their control or eradication. Nonnative plants have been reduced in numbers in the populations that are fenced. These ongoing conservation efforts for this species benefit only west Maui populations. The species as a whole is still impacted by these threats and will require long-term monitoring and management to maintain threat-free areas.

Immediacy of Threats:
Threats to *Schiedea pubescens* from feral pigs, goats, and nonnative plants are considered imminent because they are ongoing.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, individuals of *Schiedea pubescens* will benefit from conservation actions initiated by a

community group on Lanai and the West Maui Mountain Watershed Partnership, funded in part by the Service. These conservation actions include construction of an ungulate exclosure fence and removal of nonnative plants in the summit area of Lanai and eventual reintroduction of *S. pubescens*; and construction of ungulate exclosures and control of nonnative species in the West Maui mountains. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *S. pubescens* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

Much of the information on this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December of 1995. We incorporated additional information on this species from our files and the *Manual of Flowering Plants of Hawaii* (Wagner *et al*. 1999a). In 2004, the Pacific Islands Office contacted the following species experts: Robert Hobdy, retired from the Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Biodiversity and Mapping Program; Arthur Medeiros, U.S.G.S. Biological Resources Discipline; Hank Oppenheimer, resource manager for the Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden. No new information was provided. In 2005, we contacted species experts and confirmation of status was provided by Hank Oppenheimer, Maui Land and Pineapple Company, and Ken Wood, National Tropical Botanical Garden. In 2006 and 2008 status information was provided by Hank Oppenheimer, Plant Extinction Prevention Program, and incorporated into this assessment. In 2009 we received no new information. In 2010, we contacted the species experts listed below, and Ane Bakutis (PEP), Hank Oppenheimer, (PEP), and Steve Perlman (NTBG), provided new information.

List all experts contacted:

Name	Date	Affiliation
Agorastos, Nick	02/09/10	Division of Forestry and Wildlife
Anderson, Stephen	02/09/10	National Park Service, Haleakala NP, Maui
Aruch, Sam	02/09/10	private contractor
Bakutis, Ane	02/09/10	Plant Extinction Prevention Program, Molokai
Ball, Donna	02/09/10	U.S. FWS, Partners Program, Hawaii Island
Beavers, Sally	02/09/10	National Park Service, Hawaii Island
Bily, Pat	02/09/10	The Nature Conservancy, Maui
Bio, Kealii	02/09/10	Plant Extinction Prevention Program, Hawaii Island
Brosius, Chris	02/09/10	West Maui Mountains Watershed Partnership
Caraway, Vickie	02/09/10	Hawaii Division of Forestry and Wildlife, Oahu
Ching, Susan	02/09/10	Plant Extinction Prevention Program, Oahu
Cole, Colleen	02/09/10	Three Mountain Alliance
Conry, Paul	02/09/10	Hawaii Department of Land and Natural Resources
Coordinator	02/09/10	East Maui Watershed Partnership
Duvall, Fern	02/09/10	Hawaii Division of Forestry and Wildlife, Maui
Fay, Kerri	02/09/10	The Nature Conservancy, Maui

Garnett, Bill	02/09/10	National Park Service, Kalaupapa, Molokai
Giffin, Jon	02/09/10	The Nature Conservancy, Hawaii Island
Haus, Bill	02/09/10	National Park Service, Haleakala NP, Maui
Higashino, Jennifer	02/09/10	U.S. FWS, Maui
Imada, Clyde	02/09/10	Bishop Museum
Jacobi, Jim	02/09/10	U.S.G.S., Biological Resources Division
Kawakami, Galen	02/09/10	Division of Forestry and Wildlife, Kauai
Kawelo, Kapua	02/09/10	U.S. Army, Environmental Division
Kier, Matt	02/09/10	U.S. Army, Environmental Division
Kiyabu, Brian	02/09/10	Amy Greenwell Botanical Garden
Kraus, Jim	02/09/10	U.S. FWS, Hakalau NWR
Medeiros, Arthur	02/09/10	U.S. Geological Survey
Misaki, Ed	02/09/10	The Nature Conservancy, Molokai
Moriyasu, Patty	02/09/10	Volcano Rare Plant Facility, Hawaii Island
Moses, Wailana	02/09/10	The Nature Conservancy, Molokai
Nakai, Glynnis	02/09/10	U.S. FWS, Refuges, Maui
Oppenheimer, Hank	02/09/10	Plant Extinction Prevention Program, Maui Nui
Palomino, Anna	02/09/10	Olinda Rare Plant Nursery, Maui
Palumbo, David	02/09/10	National Park Service, Haleakala NP, Maui
Pepi, Vanessa	02/09/10	U.S. Navy, Environmental Contractor
Perlman, Steve	02/09/10	National Tropical Botanical Garden
Perry, Lyman	02/09/10	Division of Forestry and Wildlife, Hawaii Island
Plunkett, Bryan	02/09/10	Lanai Forest and Watershed Partnership
Pratt, Linda	02/09/10	U.S.G.S., Biological Resources Division
Purell, Melora	02/09/10	Kohala Watershed Partnership
Seidman, Stephanie	02/09/10	Maui Nui Botanical Garden
Shishido, Glenn	02/09/10	Division of Forestry and Wildlife, Maui
Silbernagle, Mike	02/09/10	U.S. FWS, Refuges, Oahu
Smith, Miranda	02/09/10	Koolau Mountains Watershed Partnership
Starr, Forest	02/09/10	U.S. Geological Survey
Tanaka, Daniel	02/09/10	Puu Kukui Watershed Preserve
Ward, Joe	02/09/10	Puu Kukui Watershed Preserve
Welton, Patti	02/09/10	National Park Service, Haleakala NP, Maui
Wood, Ken	02/09/10	National Tropical Botanical Garden
Wysong, Michael	02/09/10	DLNR Natural Area Reserves, Kauai

The Hawaii Biodiversity and Mapping Program identified this species as critically imperiled (HBMP 2006). Based on the International Union for Conservation of Nature and Natural Resources Red List of Threatened Species, this species is recognized as Endangered (facing a very high risk of extinction in the wild) by Wagner *et al*. (1999b). *Schiedea pubescens* is included in the list of species in Hawaii's 2005 Comprehensive Wildlife Conservation Strategy (Mitchell *et al*. 2005).

COORDINATION WITH STATES

On February 11, 2010, we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. No additional information

or comments were received.

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Cuddihy, L.W., and C.P. Stone. 1990. Alteration of native Hawaiian vegetation; effects of humans, their activities and introductions. Cooperative National Park Resources Studies Unit, University of Hawaii, Honolulu. 138 pp.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:

Acting Carolyn A. Bohan
Regional Director, Region 1, Fish and Wildlife Service

5/18/10
Date

Rowan W Gould
ACTING
Director, Fish and Wildlife Service

October 22, 2010

Concur:

Do not concur: _____ Date: _____
Director, Fish and Wildlife Service

Director's Remarks:

Date of annual review: Date: April 22, 2010
Conducted by: Cheryl Phillipson, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:

PIFWO Review

Reviewed by: Christa Russell Date: April 26, 2010
Prelisting and Listing Program Coordinator

Marilet Zablan Date: April 26, 2010
Assistant Field Supervisor, Endangered Species Division

Gina Shultz Date: April 30, 2010
Acting Field Supervisor